

WHAT IS CLAIMED IS:

1 1. An automated method to catch and release a plunger which travels in a production
2 tubing for a well, which method comprises:

3 sensing arrival of a plunger at a surface catcher chamber and sending a signal to a
4 controller;

5 sending a signal from said controller to actuate a stem in order to hold said plunger
6 in said surface catcher chamber;

7 closing a flow line in order to stop fluid flow through said production tubing;

8 holding said plunger for a predetermined time;

9 retracting said stem in order to permit said plunger to fall by gravity; and

10 opening said flow line in order to permit fluid flow therethrough.

1 2. An automated method to catch and release a plunger as set forth in Claim 1 including
2 sequentially repeating the process.

1 3. An automated method to catch and release a plunger as set forth in Claim 1 including
2 the additional steps following said closing said flow line of:

3 sending a signal from said controller to an actuated valve on a chemical launcher;

4 opening said valve on said chemical launcher, thereby releasing chemical; and

5 actuating said valve to close the release of chemical.

1 4. An automated method to catch and release a plunger as set forth in Claim 3 wherein
2 said chemical launcher is in angular relation to said production tubing.

1 5. An automated method to catch and release a plunger as set forth in Claim 3 wherein
2 said chemical is in the form of solid spheres.

1 6. An automated method to catch and release a plunger as set forth in Claim 1 wherein
2 said plunger is metallic and wherein a magnetic sensor senses said arrival of said plunger.

1 7. An automated method to catch and release a plunger as set forth in Claim 1 wherein
2 said steps of actuating said stem and retracting said stem is performed by actuator activated by gas
3 pressure.

1 8. An automated method to catch and release a plunger as set forth in Claim 1 wherein
2 said stem activates a spring and ball to hold said plunger at the top of said production tubing.

1 9. An automated method to catch and release a plunger as set forth in Claim 1 wherein
2 closing and opening of said flowline is accomplished by a valve and actuator in communication with
3 said controller.

1 10. An automated method to catch and release a plunger which travels in a production
2 tubing for a well, which method comprises:

3 sensing arrival of a plunger at a surface catcher chamber and sending a signal to a
4 controller;
5 sending a signal from said controller to actuate a stem in order to hold said plunger
6 in said surface catcher chamber;
7 closing the flowline in order to stop fluid flow through said production tubing;
8 sending a signal from said controller to an actuated valve on a chemical launcher;
9 opening said actuated valve on said chemical launcher, thereby releasing chemical;
10 actuating said valve to close release of chemical;
11 holding said plunger for a predetermined time;
12 retracting said stem in order to permit said plunger to fall by gravity; and
13 opening said flowline in order to permit fluid flow therethrough.

1 11. An automated method to catch and release a plunger as set forth in Claim 10 wherein
2 said chemical launcher is in angular relation to said production tubing.

1 12. An automated method to catch and release a plunger as set forth in Claim 10 wherein
2 said chemical is in the form of solid spheres.

1 13. An automated method to catch and release a plunger as set forth in Claim 10 wherein
2 said chemical is chosen from the group consisting of surfactants, foams, corrosion inhibitors, scale
3 inhibitors, methanol and paraffin solvents and dispersants.

1 14. An automated catch and release plunger and chemical application apparatus for a
2 production tubing for a well, which apparatus comprises:

3 a surface plunger catcher at the top of said production tubing having a stem movable
4 in order to hold said plunger in said surface plunger catcher in response to a signal from a controller;

5 a valve to close or open a flowline in order to stop or open fluid flow through said
6 production tubing in response to signals from said controller; and

7 a chemical launcher in angular relation to the production tubing wherein a valve
8 actuated by signals from said controller opens said valve to release chemical therefrom and closes
9 said valve to prevent release of chemical therefrom.

1 15. An automated catch and release plunger and chemical application apparatus as set
2 forth in Claim 14 including a magnetic sensor that senses arrival of said plunger at said surface
3 plunger.

1 16. An automated catch and release plunger and chemical application apparatus as set
2 forth in Claim 14 wherein said stem is actuated by gas pressure and wherein said stem activates a
3 spring and ball so that said ball blocks the path of said plunger.